UNICEF/HQ99-0812/LeMoyne

Water and Sanitation for All: Bringing the Issue Home

AN EARLY CHILDHOOD UNIT (PRE-K TO 2)

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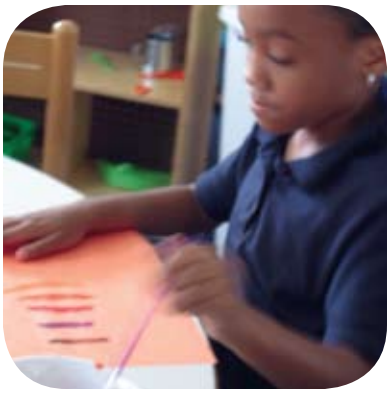

We would like to thank the first grade staff and students at Coastal Empire Montessori School in Savannah, GA (USA) for welcoming us into their classroom and for providing feedback and additional resources for this unit.

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A Note to Parents, Educators, and Other Concerned Adults

Dear Educator/ Parent or Guardian,

Water and Sanitation for All (An Early Childhood Unit) is designed for children in preschool through second grade. This classroom resource guide is intended to introduce young students to the world's water resources and to discover age-appropriate ways to get them involved in preserving these resources. This unit takes an interdisciplinary and multi-cultural approach to explaining issues and concepts such as different uses of water, the water cycle, and responsible water use and sanitation through the use of photography, children's literature, and concept mapping. Each lesson is built around a central concept that may take one or more days to develop, depending on students' prior knowledge and experiences as determined by the pre-assessment results. Each lesson may be administered using a variety of student grouping methods and supplemented with learning center activities and opportunities for home learning. A bibliography for educators and resources for further research are also provided.

Water and Sanitation for All (An Early Childhood Unit) is a guide for youth brought to you by the U.S. Fund for UNICEF's Education Department, which aims to give young people vital information about the global water crisis and suggest ways they can get involved. The guide provides background information about water use in the U.S., gives young people a glimpse into the lives of children in countries without easy access to clean water, describes ways that UNICEF is responding to this global crisis, and helps young people think of ways they can raise awareness among their peers, families, and communities. The guide can be used with families, at after-school nature clubs, scout troop meetings, camp settings, classrooms, tutoring centers, and more. It is meant to be the foundation for discussion, debate, and action. Please see the reference section, which includes places to go for more information and ways to extend the discussion.

Please let us know how you used this guide and how we can make it a more valuable resource for you. We want to hear from you! Contact us at teachUNICEF@unicefusa.org.

Sincerely,

Education Team
U.S. Fund for UNICEF

Background Information

The conceptual gap between turning on a kitchen water faucet and walking 4 kilometers to fetch and lug water back home is almost too large for most adults to grasp, much less for schoolchildren. The same can be said about a household bathroom versus a distant communal latrine shared by several families. Furthermore, the notion of not having access to a toilet or a hand-washing facility at school or work is removed from many lives in the United States. Yet nearly 2.5 billion people do not have access to improved sanitation facilities. It is a bleak reality (UNICEF, 2009).

UNICEF Water, Sanitation and Hygiene (WASH) programs are active in over 90 of the more than 150 countries in which UNICEF works; helping to improve access to water and sanitation as well as improving critical hygiene behaviors such as hand washing with soap. In countries such as the U.S., where water is treated, piped into homes, and then carried off by efficient sewage systems, the availability of clean water, proper hygiene, and sanitation is mostly taken for granted. In areas where human waste is not carried off by sewage systems, or safely disposed of in pit latrines or other sanitation facilities, proper hygiene awareness becomes critical. UNICEF WASH programs attempt to raise awareness of these issues.

Currently, UNICEF monitors nations according to whether they have "improved" or "unimproved" access to water and sanitation. Improved access includes countries with water sources such as protected wells, harvested rainwater, and public standpipes, and sanitation facilities such as septic tanks and pit latrines. Currently, almost fifty percent of the developing world's population—2.5 billion people—lack improved sanitation facilities, and over 884 million people still use unsafe drinking water sources (UNICEF, 2009). The number of individuals without these basic services is expected to continue to grow. What is considered a dangerous situation could escalate into a global crisis as water shortages begin to appear in industrialized nations as a result of global warming, lack of conservation measures, and increased contamination of the world's water supply. Although water covers over 70 percent of the earth's surface, just a fraction of it is useable, the ocean holds 97 percent, the remaining 3 percent is fresh water that is found hidden in underground aquifers, frozen in glaciers or in rivers and lakes (U.S. Department of Commerce, 2009).

Water and Children, Sanitation and Survival

The effects of not having access to clean water and adequate sanitation facilities go far beyond convenience and aesthetics. The lack of adequate sanitation facilities is just as deadly — 1 gram of feces can contain viruses, bacteria, parasite cysts, and parasite eggs. Water and sanitation-related illnesses include diarrhea, which kills nearly 2.2 million children, mostly under 5 each year; malaria, a disease exacerbated by poor drainage and uncovered water; and trachoma, a disease caused by the lack of water combined with poor hygiene practices has blinded millions of people, studies have found that access to an adequate water supply could reduce trachoma by 25% (UNICEF, 2009). In addition, hand washing with soap is linked to dramatic reductions in the incidence of respiratory illnesses such as pneumonia — the number one cause of child mortality globally.

For those living without access to a safe water supply, finding and carrying water can become a chore that eclipses all others and a burden that might determine a child's future. Women and children, especially girls, are most often the family water collectors. Fetching water can mean walking to a water source many miles away or waiting for hours in water lines. In about 90 countries around the world including Nicaragua, Iraq, Sudan, Colombia, Vietnam, and Uzbekistan — many girls miss school because they have to collect water or stay home to care for family members sickened by water-based illnesses, which is often caused by contaminants such as parasites. Of the children who do attend school, many are faced with the same challenges there. Lack of clean water for drinking and hand washing and the absence of private and adequate toilets compromises children's ability to learn and often causes them to leave school altogether. Girls are especially vulnerable to this; many drop out once they reach puberty due to the lack of private and safe sanitation facilities. In short, children stay in school longer, perform better, and are less susceptible to decreased mental and physical development when they have access to improved water and sanitation.

The UN and UNICEF: Responding to the Need

In September 2000, the UN crafted a set of eight goals, the Millennium Development Goals (MDGs), that affirmed the world's "shared duty" to all people, especially children and the poor. These goals include aims such as halving extreme poverty, stemming the spread of HIV/AIDS, and providing universal primary education. The MDGs have brought together nonprofit organizations, governments, research and policy institutions, and advocacy groups on a global level in an effort to improve the living, learning, and working conditions of the world's most vulnerable. All of the MDGs are interlinked. For example, although goal #7 speaks specifically to environmental issues, it is recognized that providing water and sanitation is crucial for the success of all the MDGs. Without ensuring safe water, sanitation, and hygiene education for all, it will be impossible to meet the other goals.

UNICEF has used the MDGs, among other goals set by other international organizations, to guide its work in water and sanitation. UNICEF began its first water and sanitation program in India in 1966 and has since worked in numerous developing countries on this issue, with WASH programs that help to provide clean water, latrines, and hygiene education to children and their communities. UNICEF's strategy revolves around four elements: creating child-friendly facilities, providing training in hygiene education for teachers and children, offering outreach to communities, and contributing to policy work for the development of sustainable models.

Thanks to global efforts by the work of national governments, communities, and international partners such as UNICEF, the world is currently on track to halve the number of people without access to a safe water supply by 2015.

The work to provide sanitation, on the other hand, is much further behind, though, and in recognition of this need to escalate efforts globally, 2008 was designated the International Year of Sanitation (IYS) (United Nations, 2009).

The IYS had five key messages:

1. Sanitation is vital for health.
2. Sanitation is social development.
3. Sanitation is a good economic investment.
4. Sanitation is good for the environment.
5. Sanitation is achievable.

"We Are All Downstream": Water Connects Us

It is impossible to overstate the impact of water and sanitation in our lives. Far from being a source merely for drinking and bathing, water is needed by all types of industries: agriculture, power production, household use, ore and mineral extraction, livestock husbandry, and other commercial uses. The amount of water used in everyday products is vastly larger than most people realize. It takes 1000 to 3000 liters of water to produce a kilogram of rice and 13,000 to 15,000 liters to produce a kilogram of grain-fed beef (United Nations Water, N.D.).

We all draw water from the same global "well," and we need increasingly more of it with increased demand from agriculture, industry, and municipal use. Instead of having access to more, however, we are faced with the prospect of making do with less as pressure on our water sources intensifies. In the U.S., the impact is that we are becoming more conservative in water usage patterns and regulating more stringently industry and effluent standards. In developing countries, however, this situation is decidedly more acute because the "common well" is often used for multiple purposes ranging from bathing to cooking, to running small businesses. Water sources are often untreated and unregulated—leading to precarious levels of pollution that threaten public health and safety. For this reason, a heightened priority is placed on basic hygiene and sanitation in developing countries (while more structural changes in water treatment and regulation can be put in place), while "more developed" countries are at the stage of regulating consumption patterns and industrial effluents.

The world's freshwater resources are becoming increasingly contaminated by pesticides, industrial runoff, and human waste. Global warming is wreaking havoc on weather patterns, leading to droughts, floods, and other extreme climatic changes that can affect water supplies. Communal water sources such as glaciers are melting, decreasing the amount of runoff that fills rivers and lakes, and, additionally, more precipitation is coming as rain rather than as snow, leaving snow packs insufficient to supply reservoirs during the summer months. Around the world, countries are dealing with water scarcity in various ways: rationing/ regulation (U.S.), wastewater reuse (global but largely in the Middle East and North Africa), water recycling (France), and ecosanitation (a way of recuperating the nutrients in wastewater and returning them to productive uses), among others.

The connections between domestic consumption, use of water and sanitation, and global water management, though deeply evident to many, remains an abstract notion to most of us in the United States. Because most of our water supply is clean, cheap, and easily accessible, we believe it to be limitless. For some, however, the fragility of our own water system is becoming painfully

evident. In 2007, Georgia officials warned that Lake Lanier, a reservoir in northern Georgia that supplies over 3 million residents with water, was on the verge of depletion, with smaller regional reservoirs in even worse condition (Associated Press, 2007). Water rationing is a reality in many places in the West and South, and it will become increasingly common throughout the United States. Likely we will look to new and innovative ways of managing our resources more responsibly in the future, borrowing from the examples of countries that are already managing scarce water resources. We are all connected to this finite resource, and we must connect ourselves to those who struggle for it so that we can work to find long-lasting, global solutions.

For the most up-to-date statistics and information, please visit:
http://www.childinfo.org
http://www.unicef.org/wash
http://www.unesco.org/water
http://www.unwater.org

Unit Overview

Water and Sanitation for All (An Early Education Unit) has four lessons. They are designed:

1. To raise awareness of the problems facing children with inadequate access to clean water or sanitation facilities.
2. To increase students' understanding of the world water crisis as one that affects everyone.
3. To explore how organizations, agencies, and individuals are working to address the problems.
4. To encourage students to take their own steps in addressing the local and global issues of water and sanitation.

Lesson 1: Our Blue Planet: Water on Earth: Children develop awareness of the importance of water on Earth for all living things. They learn that clean, safe water sources are limited; therefore, they must develop responsible habits when using water.

Lesson 2: The Never-Ending Water Cycle on Earth: Children are introduced to the water cycle. They learn that all water passes through a continuous cycle and that water exists in three states: solid, liquid, and gas.

Lesson 3: Safe Waters, Healthy Communities: Children are introduced to causes and effects of water issues, including drought, flooding, and polluted waters. They develop awareness of the importance of responsible water use and sanitation, including hygienic practices such as proper hand-washing and safe waste disposal.

Lesson 4: Water Care and Conservation: In this culminating lesson, children learn about the importance of conservation of natural resources. They explore ways to conserve water and develop awareness of the work of organizations such as UNICEF that bring water, sanitation, and hygiene to children worldwide. Children share their learning as they help to plan and participate in World Water Day (March 22) or another water awareness event.

National Standards Alignment

The TeachUNICEF lesson plans are designed in line with National Content Standards. Using the National Content Standards as a guide, these lessons can be aligned with State Standards.

	Lesson			
National Organization	**1**	**2**	**3**	**4**
National Association for the Education of Young Children (PreK-K) Source: Curriculum: A Guide to the NAEYC Early Childhood Program Standard and Related Accreditation Criteria				
Language Developments				
Children have varied opportunities to develop competence in verbal and nonverbal communication by responding to questions; communicating needs, thoughts, and experiences; and describing things and events. (2.D.03)	✓	✓	✓	✓
Children who are nonverbal are provided alternative communication strategies. (2.D.05)	✓	✓	✓	✓
Children have varied opportunities and materials that encourage them to have discussions to solve problems that are interpersonal and those that are related to the physical world. (2.D.06)	✓	✓	✓	✓
Children are provided varied opportunities and materials that encourage them to engage in discussions with one another. (2.D.07)	✓	✓	✓	✓
Early Literacy				
Children have opportunities to become familiar with print. They are actively involved in making sense of print, and they have opportunities to become familiar with, recognize, and use print that is accessible throughout the classroom. (2.E.03)	✓	✓	✓	✓
Children have multiple and varied opportunities to write… and are given the support they need to write on their own, including access to the alphabet and to printed words about topics of current interest, both of which are made available at eye level or on laminated cards; Children see teaching staff model functional use of writing and are helped to discuss the many ways writing is used in daily life. (2.E.05)	✓	✓	✓	✓
Science				
Children are provided varied opportunities and materials to learn key content and principles of science such as he difference between living and nonliving things (e.g., plants versus rocks) and life cycles of various organisms (e.g., plants, butterflies, humans); Earth and sky (e.g., seasons; weather; geologic features; light and shadow; sun, moon, and stars); Structure and property of matter (e.g., characteristics that include concepts such as hard and soft, floating and sinking) and behavior of materials (e.g., transformation of liquids and solids by dissolving or melting). (2.G.02)	✓	✓	✓	✓

	Lesson			
National Organization	**1**	**2**	**3**	**4**
Children are provided varied opportunities and materials that encourage them to use the five senses to observe, explore, and experiment with scientific phenomena. (2.G.03)	✓	✓	✓	✓
Children are provided varied opportunities and materials that encourage them to think, question, and reason about observed and inferred phenomena. (2.G.04)	✓	✓	✓	✓
Children are provided varied opportunities and materials that encourage them to discuss scientific concepts in everyday conversation. (2.G.07)	✓	✓	✓	✓
Children are provided varied opportunities and materials that help them learn and use scientific terminology and vocabulary associated with the content areas. (2.G.08)	✓	✓	✓	✓
Creative Expression and Appreciation for the Arts				
Children are provided varied opportunities to gain an appreciation of art, music, drama, and dance in ways that reflect cultural diversity. (2.J.01)			✓	✓
Children have opportunities to respond to the art of other children and adults. (2.J.07)	✓	✓	✓	✓
Health and Safety				
Children are provided varied opportunities and materials that encourage good health practices such as serving and feeding themselves, rest, good nutrition, exercise, hand-washing, and tooth-brushing. (2.K.01)			✓	✓
Social Studies				
Children are provided varied opportunities and materials to learn about physical characteristics of their local environment as a foundation for learning geography. (2.L.07)	✓			
Children are provided varied opportunities and materials to learn how people affect their environment in positive (e.g., recycling) and negative (e.g., polluting) ways. (2.L.08)	✓	✓	✓	✓
Children are provided varied opportunities and materials that allow them to contribute to the well-being of their classroom and the community, including care for the social and physical environments in which they live. (2.L.09)				✓
National Academy of Science (K-4) Source: National Science Education Standards				
Content Standard D: Earth and Space Science As a result of activities in grades K–4, all students should develop an understanding of • Properties of earth materials • Changes in earth and sky	✓	✓	✓	✓

National Organization	Lesson 1	2	3	4
Content Standard F: Science in Personal and Social Perspectives As a result of activities in grades K–4, all students should develop an understanding of • Personal health • Types of resources • Changes in environments	✓	✓	✓	✓
National Council for the Social Studies Curriculum Standards for Social Studies (Early Grades) Source: Expectations of Excellence - Curriculum Standards for Social Studies				
People, Places, and Environments Social studies programs should include experiences that provide for the study of people, places, and environments.	✓		✓	✓
Global Connections Social studies programs should include experiences that provide for the study of global connections and interdependence.	✓	✓	✓	✓
National Geography Standards, Geography Education Standards Project (K-12) Source: Geography for life: The National Geography Standards				
The World in Spatial Terms **Standard 1:** Students understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.	✓			
Places and Regions **Standard 4:** Students understand the physical and human characteristics of places.	✓			
Physical Systems **Standard 7:** Students understand the physical processes that shape the patterns of Earth's surface.		✓		
Environment and Society **Standard 14:** Students understand how human actions modify the physical environment. **Standard 15:** Students understand how physical systems affect human systems. **Standard 16:** Students understand the changes that occur in the meaning, use, distribution, and importance of resources.	✓	✓	✓	✓

National Organization	Lesson 1	2	3	4
National Council of Educators of English (NCTE)/International Reading Association (IRA) Standards for the English Language Arts (K-12) Source: Standards for the English Language Arts				
Standard 1: Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace.	✓	✓	✓	✓
Standard 5: Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.	✓	✓	✓	✓
The Joint Committee on National Health Education Standards (PreK-2) Source: National Health Education Standards: Achieving Excellence				
Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health. **Pre-K-Grade 2** 1.2.1 Identify that healthy behaviors impact personal health. 1.2.3 Describe ways to prevent communicable diseases.	✓	✓	✓	✓
Standard 4: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks. **Pre-K-Grade 2** 4.2.2 Demonstrate listening skills to enhance health. 4.		✓	✓	✓
Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and reduce health risks. **Pre-K-Grade 2** 7.2.1 Demonstrate healthy practices and behaviors to maintain or improve personal health. 7.2.2 Demonstrate behaviors that avoid or reduce health risks.				✓
Standard 8: Students will demonstrate the ability to advocate for personal, family and community health. **Pre-K-Grade 2** 8.2.1 Make requests to promote personal health. 8.2.2 Encourage peers to make positive health choices.				✓

Concept Mapping With Young Learners

Concept mapping is an effective instructional strategy for teaching children about concepts and their interrelationships. Developed in the 1960s by Joseph D. Novak and colleagues at Cornell University (Novak, 1990), concept mapping has been used effectively for decades across disciplines with students of all ages (Cassata & French, 2006). With appropriate adult modeling and facilitation, concept mapping can have notable benefits for young children. As early learners develop language skills, concept mapping permits them to build upon prior knowledge, to visualize the relationship between concepts, and to make comparisons (e.g., Gallenstein, 2005). Concept mapping also affords the expression of ideas not readily available to children who are developing literacy skills. Further, concept mapping accommodates various types of learning preferences, including visual, social, and kinesthetic.

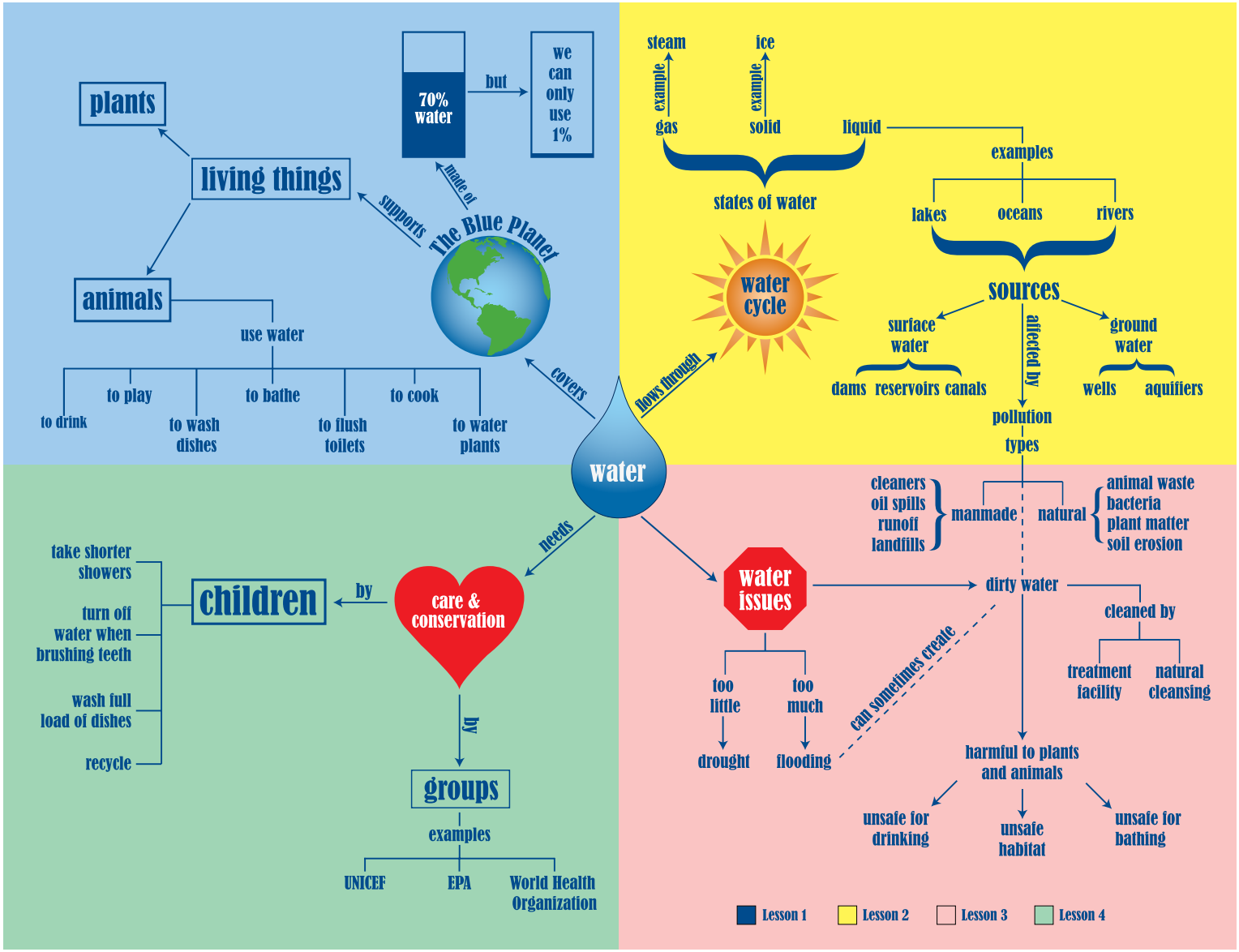
The following are recommendations prior to implementing concept mapping with children in the lower grades:

- If this is the children's first exposure to concept mapping, create a map about something with which the children are familiar (e.g., the family).
- Provide concrete objects, picture cards, photographs, or other tangible representations which children may manipulate in small groups or individualized instruction rather than using solely words.
- Show connections between concepts with string or yarn, pipe cleaners, or laminated arrows.

The use of concept mapping in Water and Sanitation for All is at the discretion of the educator; possible purposes include: (1) generation of ideas about what children already know; (2) brainstorming possible explanations or examples; (3) showing relationships among concepts; (4) assessing understandings and possible misconceptions; and (5) communicating feelings.

On the subsequent page is a concept map highlighting the main concepts in *Water and Sanitation for All*, relationships among concepts, patterns, and learner outcomes. Segments of the map will be introduced in each lesson, building upon the children's understandings of the unit's concepts. While concepts are situated within specific quadrants, these concepts may overlap and educators are encouraged to revisit areas as appropriate. Please note that the complexity of the map may be modified for the various ages and ability levels of children. Educators are encouraged to use a combination of words and images (including children's own artwork, such as illustrations and photographs) to represent concepts and relationships on the map.

Concept Map: Water and Sanitation for All: Bringing the Issue Home



Using Photography with Young Learners

Overview

Visual language, deemed an "essential component of the English language arts curriculum" (NCTE, 1996, p. 5), is included among reading, writing, and listening to compose the four forms of literacy. In addition to charts, graphs, and other visual displays, photographs are one medium through which individuals may develop visual literacy. Like drawings, children's photographs can be used to convey meaning, to tell stories (Lightfoot & Ewald, 2002). Contemporary society demands that citizens be able to interpret, analyze, and create visual representations as a means of communication and self-expression (NCTE, 1996). Not surprisingly, Information and Communication Technologies (ICT) Digital Literacy, including the ability to use computers, media, and other digital technologies such as digital photography to communicate information and ideas, is considered a 21st century skill needed for success in school and life (Partnership for 21st Century Skills, 2004).

Indeed, photography is a powerful learning tool that may facilitate young children's literacy development (Baskwill & Harkins, 2009; Labbo, Eakle, & Montero, 2002; Lightfoot & Ewald, 2002). Used to document children's own experiences, the process of taking and later describing what was captured in photographs can enhance children's understanding of sequencing, language and communication skills, and eventual story-writing abilities (Gooch, 2002). Pairing photography and writing may have enhanced benefits of improving children's visual and linguistic competencies (Baskwill & Harkins, 2009). The use of photography as a tool for literacy development can also serve as a "catalyst for… confidence boosting" (Baskwill & Harkins, 2009, p. 29).

Using photography with emergent readers may also serve as a parent education tool and a means to encourage parental engagement in children's learning. Together, parents and their children may take photographs and later recall their experiences in detail orally or in writing, with parents transcribing for their children or the children writing or typing the text to accompany the photographs (for ideas, see Baskwill & Harkins, 2009).

Process

Lightfoot and Ewald (2002) recommend that adults facilitate children as they interpret photographs prior to engaging them in the process of being photographers. The authors explain that adults may first encourage children to examine photographs closely, to notice details, and to determine how photographs can convey meaning and evoke emotions. Depending upon a child's age and maturity, one may also engage the child in determining various types of photographs and their purposes, including those used in advertisements, magazines, books, news media, and other venues.

Children's photographs may be used in a variety of ways. Photographs may be printed and displayed in the classroom, placed in hard-copy books, or digitally manipulated to create digital stories and use with other multimedia. In this unit, it is recommended to incorporate the children's photographs throughout the concept map as appropriate.

Note: Adults may choose from a variety of simple to more complex cameras, depending upon comfort level, skill set, and the age of the children. Simple disposable cameras may be an appropriate way to begin to incorporate photography in learning. With more experience, digital cameras may be integrated.

Pre-/Post-Assessment

Awareness of students' prior knowledge and experiences related to the unit's main concepts will inform the educator's implementation of the learning activities that follow. Pre-assessment results may also be used as a baseline to determine student learning at the completion of the unit (post-assessment).

Water and Sanitation for All includes the following student learning objectives:

Objective #1: Demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.

Objective #2: Demonstrate understanding that all water on Earth is recycled through a continuous process called the *water cycle*.

Objective #3: Recognize water in its three states: solid, liquid, gas.

Objective #4: Demonstrate responsible water use and sanitation, including using only the amount of water you need, limiting the amount you use for fun, keeping water sources clean (e.g., safe waste disposal), and exhibiting hygienic practices (e.g., proper hand-washing).

Objective #5: Recognize the work of organizations such as UNICEF that bring water, sanitation, and hygiene to children worldwide.

Assessment activities may be conducted with individual children, in small groups, or as a whole class, as deemed appropriate by the educator. Assessment activities may be completed in one session or broken into separate segments by objective measured. Older students may record their answers to each prompt, whereas the responses of younger students may be transcribed by an adult. Suggested photographs are provided to accompany each assessment activity; however, the educator may wish to select additional or different photographs, artworks, or pages from new or familiar children's literature that relate to each prompt.

Materials

- Pre-/Post-Assessment data sheet
- Photographs of water use and sanitation

Essential Questions

- How do animals and plants use water? What happens if they do not have enough clean water?
- Where is water located? Where have you seen water? Where does it come from?
- What different forms does water take? What causes water to take different forms?
- How do you use water? How can you use water properly to be healthy and to ensure that plants and animals have safe, clean water they need?
- How do community helpers keep our water clean and safe for drinking, bathing, and other activities?

Procedures

1. Explain that the purposes of these questions are to help your instruction and to meet the students' instructional needs. Encourage students to answer to the best of their abilities, recognizing that they may not be familiar with some of the questions asked.
2. Display the suggested or educator-selected photographs for each prompt.
3. Complete each pre-assessment activity using the provided prompts. (Note: Based on the receptive and expressive language abilities of each student, the educator may wish to adjust the wording of each prompt.)
4. Record the score that most accurately matches the student's response.
5. Transfer the student's baseline scores to the post-assessment scoring sheet for before-and-after comparison at the completion of the unit.

Objective #1: Demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.

Sample Prompt:

Together, we will be learning about water. First, I would like to learn what you know about water.

- *How do animals and plants use water?*
- *What happens if they do not have enough clean water?*

Display photos of water use by plants and animals. (Note: Sample photographs available in Educator Resources). *Now look at these photographs.*

- *How do you think plants and animals are using water in these photos? What happens if they do not have enough clean water?*

Notes		
☐ **No Evidence** **0 points**	☐ **Some Evidence** **1 point**	☐ **Strong Evidence** **2 points**
With or without viewing photographs as prompts, the student demonstrates no understanding of the importance of water on Earth with emphasis on plants and animals and/or demonstrates misconceptions about water uses for plants and animals.	Without viewing photographs as prompts, the student demonstrates little to no understanding of the importance of water on Earth with emphasis on plants and animals. Viewing photographs as prompts, the student demonstrates some understanding of the importance of water for living things (see *strong evidence*).	Without viewing photographs as prompts, the student accurately explains that water is essential to life on Earth. Without water, living things would perish and ecosystems would cease to exist. Examples include: Animals: • For drinking • For bathing (i.e., for proper hygiene) • For cooking • For farming/fishing Plants: • To transport nutrients from roots to plant parts • Essential to the process of photosynthesis

Objective #2: Demonstrate understanding that all water on Earth is recycled through a continuous process called *the water cycle*.

Sample Prompt:

- *Where is water located? Where have you seen water? Where does it come from?*

Display photos of various water sources, such as lakes, rivers, and oceans. (Note: Sample photographs available in Educator Resources). *Now look at these photographs.*

- *Where do you see water? (Student can point and/or describe).*
- *Do you think the water stays in the same places or does it change and move?*
- *If you believe water can change and move, what is this process called?*

Notes		
☐ **No Evidence** **0 points**	☐ **Some Evidence** **1 point**	☐ **Strong Evidence** **2 points**
The student demonstrates no understanding of *the water cycle* and/or demonstrates misconceptions about *the water cycle*.	The student demonstrates some understanding of water sources and how water is recycled through *the water cycle*. For example, the student may describe how a river flows into a large body of water or how evaporated water eventually creates rain.	The student accurately identifies three or more bodies of water (e.g., lakes, rivers, oceans) and explains in detail how water is continuously recycled through a process called *the water cycle*.

Objective #3: Recognize water in its three states: solid, liquid, gas.

Sample Prompt:

We will be learning about the process called the water cycle where all water is recycled continuously on Earth.

- *Do you know the different forms or states water can take in the water cycle?*

Display photos of the three states of water (i.e., solid, liquid, gas). (Note: Sample photographs available in Educator Resources). *Now look at these photographs.*

- *Where do you see different forms of water? (Student can point and/or describe).*
- *In what forms or state does water exist? What are these called?*

Notes		
☐ **No Evidence** **0 points**	☐ **Some Evidence** **1 point**	☐ **Strong Evidence** **2 points**
The student does not identify or incorrectly identifies the three states of water (i.e., solid, liquid, gas).	The student identifies one or two states of water (i.e., solid, liquid, gas).	The student accurately identifies the three states of water (i.e., solid, liquid, gas).

Objective #4: Demonstrate responsible water use and sanitation, including using only the amount of water you need, limiting the amount you use for fun, keeping water sources clean (e.g., safe waste disposal), and exhibiting hygienic practices (e.g., proper hand-washing).

Sample Prompt:

We will also be learning about responsible water use and sanitation. This means being smart about the water we use.

- *How can you use water responsibly so that all living things have the water they need? How can you use water to stay healthy and to prevent becoming sick?*

Display photos of responsible water use and sanitation. (Note: Sample photographs available in Educator Resources). *Now look at these photographs. Now look at these photographs of people using water.*

- *How do they use water wisely?*

Notes		
☐ **No Evidence** **0 points**	☐ **Some Evidence** **1 point**	☐ **Strong Evidence** **2 points**
With or without viewing photographs as prompts, the student demonstrates no understanding of responsible water use and sanitation.	Without viewing photographs as prompts, the student demonstrates little to no understanding of both responsible water use and sanitation Viewing photographs as prompts, the student demonstrates some understanding of responsible water use and/or sanitation (see *strong evidence*).	Without viewing photographs as prompts, the student demonstrates understanding of responsible both water use and sanitation by citing three or more examples, such as: Responsible Water Use: • Turn off water when not in use • Take short showers • Recycle materials Sanitation: • Always use soap for bathing and hand washing • Lather and rub hands for 20 or more seconds • Rinse hands well and dry

Objective #5: Recognize the work of organizations such as UNICEF that bring water, sanitation, and hygiene to children worldwide.

Sample Prompt:

Lastly, we will learn about community helpers who work to ensure all people, including children, have clean, safe water.

- *Do you know any community helpers or organizations that do this work? If so, describe what they do.*

Display photos showing the work of community helpers or organizations that work to ensure people have access to clean, safe water. (Note: Sample photographs available in Educator Resources).

Look at these photographs of people helping others have access to clean water.

- *What kind of work do you think they do to help others?*

Notes		
☐ **No Evidence** **0 points**	☐ **Some Evidence** **1 point**	☐ **Strong Evidence** **2 points**
With or without viewing photographs as prompts, the student demonstrates no understanding of community helpers or organizations that work to ensure people have access to clean, safe water.	Without viewing photographs as prompts, the student does not identify community helpers or organizations that work to ensure people have access to clean, safe water. Viewing photographs as prompts, the student demonstrates some understanding of community helpers or organizations that work to ensure people have access to clean, safe water (see *strong evidence*).	Without viewing photographs as prompts, the student recognizes and describes the work of community helpers or organizations that work to ensure people have access to clean, safe water. Community Helpers: • UNICEF workers • American Red Cross employees and volunteers • Environmental Protection Agency employees What They Do: • Teach others about water use and sanitation • Create systems for transporting clean, safe water

Objective #1: demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.

Objective #2: demonstrate understanding that all water on Earth is recycled through a continuous process called the water cycle.

Objective #3: recognize water in its three states: solid, liquid, gas

Objective #4: demonstrate responsible water use and sanitation, including using the amount of water you need, limiting the amount you use for fun, keeping water sources clean (e.g., safe waste disposal), and exhibiting hygienic practices (e.g., proper hand-washing).

Objective #5: recognize the work of organizations such as UNICEF that bring water, sanitation, and hygiene to children worldwide.

Strong Evidence = 2 points
Some Evidence = 1 point
No Evidence = 0 points

Student Name	Objective #1		Objective #2		Objective #3		Objective #4		Objective #5	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
EXAMPLE: Jane Smith	1	2	0	1	1	2	0	1	1	2

Letter to Families

Dear Parents or Guardians:

Our class is beginning a unit of study on water and sanitation. Children will be engaged in a variety of learning activities that reinforce the importance of water on Earth. Primary goals of the unit include:

1. Raise awareness of the problems facing children with inadequate access to clean water or sanitation facilities.
2. Increase students' understanding of the world water crisis as one that affects everyone.
3. Explore how organizations, agencies, and individuals are working to address the problems.
4. Encourage students to take their own steps in addressing the local and global issues of water and sanitation.

During the unit, children will explore various sources of water, how they use water daily, and ways they can help to conserve water and practice hygienic, sanitary practices.

I encourage your participation during our unit of study. Please visit the classroom to see what the children are learning. A primary learning tool during our unit includes the use of photographs and other works of art that depict water use. We will maintain a class concept map on water where we can post photographs of you and your children using water at home and in the community. Please also share any pictures from magazines and other publications as related to water and sanitation.

Our unit will culminate in the observation of World Water Day on March 22. Children will determine how we wish to commemorate this annual event, and I welcome your ideas and participation.

Sincerely,

OUR BLUE PLANET: WATER ON EARTH

Please read "Concept Mapping with Young Learners" prior to beginning this lesson. A large wall space should be reserved for the class concept map. Please make necessary adjustments to the lesson based on your established curriculum and the ages, abilities, and interests of the children. Recommendations for learning centers are provided following the unit's lessons for possible extensions.

Big Idea

Water is essential to life on Earth. All plants and animals need water to live.

Objectives

Students will:

- Demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.
- Develop beginning awareness of responsible water use and sanitation, including using only the amount of water you need, limiting the amount you use for fun, keeping water sources clean (e.g., safe waste disposal), and exhibiting hygienic practices (e.g., proper hand-washing).

Vocabulary

The following words may not be daily occurrences in a student's vocabulary. Feel free to use this list as a resource for students to expand their working vocabulary as they encounter these words in this unit.

- Clean
- Conserve
- Earth
- Globe
- Pollute/pollution
- Potable
- Responsible
- Salty
- Water

Materials Needed/Setup

- 1 globe
- computer with Internet connection and Google Earth downloaded
- projector

- materials needed for concept map (connecting material such as yarn, masking tape, or paper arrows; picture word cards labels or labeled pictures of icons)
- children's books on water (see Educator Resources)

Note: Should technology not be available, the following are appropriate substitutes:

- Printed photographs of Earth from space
- Illustrations or artwork showing various depictions of water

Procedures

Introduction (20 minutes)

1. Display a globe. Engage students in describing the globe and its purposes:

   What am I displaying?

   What do you see on the globe? What colors and features do you notice?

   What do these colors and features mean or represent?

2. Briefly compare and contrast maps and globes. Reinforce that a globe, like a map, shows the Earth from a bird's eye view, or from far, far away. But whereas a map is flat and two dimensional, a globe is round and three-dimensional, more closely showing the shape of the world's continents and oceans.

3. Launch Google Earth at http://earth.google.com/. Explain to children that one can view the three-dimensional Earth from space. By moving the mouse, you can use Google Earth to "fly" around the world, taking a virtual tour of its diverse land and water features.

View satellite images of Earth on NASA's Visible Earth website at http://visibleearth.nasa.gov/. Educators can print these photos for use on the concept map or in learning centers.

4. Ask children to describe what they see. Make a full rotation of the Earth so all surface features are observed.

   What do you see?

   What colors and features do you notice?

5. Explain that planet Earth is sometimes called the Blue Planet because it has so much water on its surface (representing 70 percent of the total surface area). Ask a student to point to all areas of water on the globe.

6. Afterward, ask children to describe their experiences with water on a daily basis.

   How do you use water?

   Where does our water for drinking, cooking, playing, and bathing come from?

   Have you seen bodies of water in nature? Where and when?

   If you have been to the ocean, did you taste the water? What did it taste like?

7. Reinforce that most of the water on the Earth's surface is salty—and therefore cannot be used by people for drinking, cooking, and bathing. Only a small amount of clean, safe water is available for our use; this is called potable water.

8. Explain that this begins a unit of study on water and how all living things need water to grow, be healthy, and thrive.

Development (30 minutes)

1. Introduce to the class the concept map—showing a reserved large wall space with water in the center where ideas, photos, illustrations, and more items related to water will be displayed throughout the unit of study.

2. Explain that just as books, poems, songs, and photographs can tell stories, so, too, can a concept map "tell a story." Using words and pictures, we will tell a story about water on Earth.

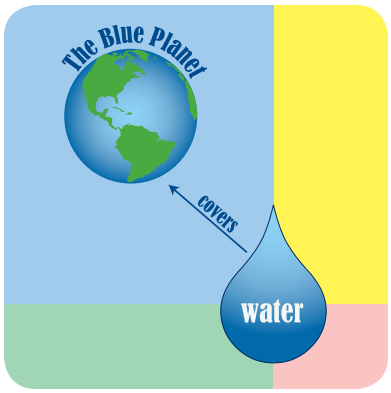
3. Point to the word water in the center of the concept map. Repeat: Planet Earth is sometimes called the Blue Planet because it is covered by a lot of water on its surface. Using yarn, masking tape, or other appropriate material, make a line connecting water to a photo of Earth from space. Label the photo: Blue Planet.

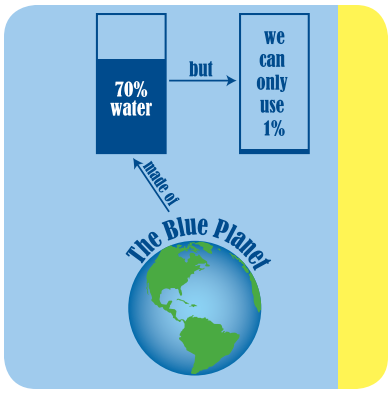
4. Model aloud the process of creating the concept map on water:

   In the top, left-hand corner of the concept map, we will share our learning about the Earth, or the Blue Planet, and how living things need and use water. Here, I have connected "water" with "Blue Planet" because water covers a lot of the Earth's surface.

   Do you remember what kind of water covers more than half of the Earth's surface? That's right, salty water. We should not drink salty water and it is not useful for bathing, cooking, or washing clothes or dishes. Connect "Blue Planet" with the glass showing 70 percent water. Apply the label "water on Earth."

   How much of the Earth's water can we drink? That's right, very, very little. Connect the glass showing 70 percent water with the glass showing only a little water. Label this "fresh water (potable) on Earth."





5. Read aloud an age-appropriate children's book about water on Earth, such as:

   Rauzon, M., & Bix, C. O. (1995). *Water, water everywhere.* San Francisco, CA: Sierra Club Books for Children.

6. During and following the reading, engage children in sharing their reactions and thoughts through questions such as:

Where is water on Earth? (Everywhere. In the ocean, in lakes, ponds, streams, rivers. Water is also underground; and it is in the sky as a gas where we cannot see it. Water is even in the bodies of plants and animals. Water is everywhere.)

Why is water sometimes called Earth's "most precious resource"? (Life on Earth depends on water).

Unit concepts will be repeated throughout. Some class discussions will naturally pertain to concepts addressed in greater depth in subsequent lessons.

How do plants and animals use water? (Plants use water to grow and to live, keeping forests and gardens alive. Animals use water to drink and some, like fish and dolphins, live in water. As animals, people need water to live. We need clean water to drink, for cooking, washing, and bathing. People use water for traveling, to help make electricity, and even for playing.)

What would happen if there were no water on Earth? (It would be very dry. All living things would die.)

How does water change? (Water can be a liquid, a solid, or a gas. It can be very hot or very cold, or a temperature in between. It can mix with other materials and change in color, taste, and other ways we cannot see.)

What do people do to water that can be harmful or bad for people, living creatures, and the Earth? (People may pollute water, or make it dirty. They may dump chemicals or other waste into the ocean or other bodies of water. Also, some people may waste water, such as by keeping water on while brushing teeth or by taking long showers.)

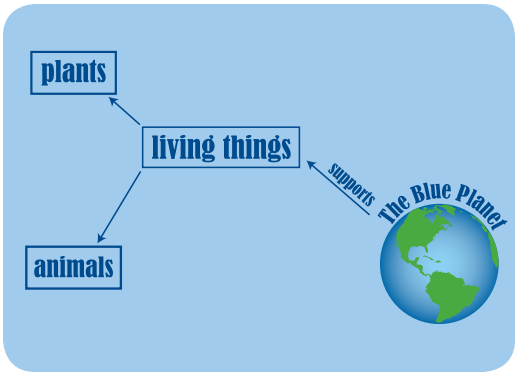
Closing (10 minutes)

Connection Between Home and School: Send home the handout "Water, Wonderful Water!" to encourage family discussions about water use at home and in the community.

7. Refer to the class concept map on water. Together, engage children in adding to the concept map using words and pictures illustrating what they have learned.

   Who or what needs water on the "Blue Planet?" That's right, all living things. Connect "Blue Planet" with "Living Things." What are two types of living things? Plants and animals. Branch "Plants" and "Animals" from "Living Things."

   Show students a variety of pictures with both plants and animals. Engage students in placing these in the appropriate sections of the concept map.



8. Encourage children to notice examples of how plants and animals use water in everyday life and in books, magazines, television, or on the Internet. Explain that we will continue to add to the concept map as we learn about our Blue Planet.

Sample Children's Artwork*

Sample prompt: How do people, plants, and animals use water?

"I use water to drink."

* All children's work and photographs provided through collaboration with Coastal Empire Montessori School in Savannah, Georgia (USA)

“This is a picture of a dolphin chasing fish in the ocean. The dolphin lives in water.”

“I am swimming in water.”

“This is me with a watering can. The flowers drink the water and grow and grow and grow.”

Water, Wonderful Water!

Water is one of the most important things in life. It can taste good, it can feel cool, and it can keep us clean.

Discuss with your child at least five ways your family uses water at home and at least five ways your child uses water in the community. Have your child draw or take photographs (and label if possible) one or more examples of each. Please send photographs or illustrations to school showing water use to add to our class concept map.

At Home	In the Community

THE NEVER-ENDING WATER CYCLE ON EARTH

A variety of educator resources are available to teach the water cycle. Please make necessary adjustments to the lesson based on your established curriculum and the ages, abilities, and interests of the children. Recommendations for learning centers are provided following the unit's lessons for possible extensions.

Big Idea

All life on Earth is interconnected. The cycle of water never ends.

Objectives

Students will:

- Demonstrate understanding that all water on Earth is recycled through a continuous process called the water cycle.
- Recognize water in its three states: solid, liquid, gas.
- Continue to develop awareness that responsible use of water includes using only the amount you need, limiting the amount you use for fun, and keeping water sources clean.

Vocabulary

The following words may not be daily occurrences in a student's vocabulary. Feel free to use this list as a resource for students to expand their working vocabulary as they encounter these words in this unit.

- Flow
- Gas
- Ground water
- Liquid
- Mix
- Solid
- Sun
- Surface water
- Water cycle

Materials Needed/Setup

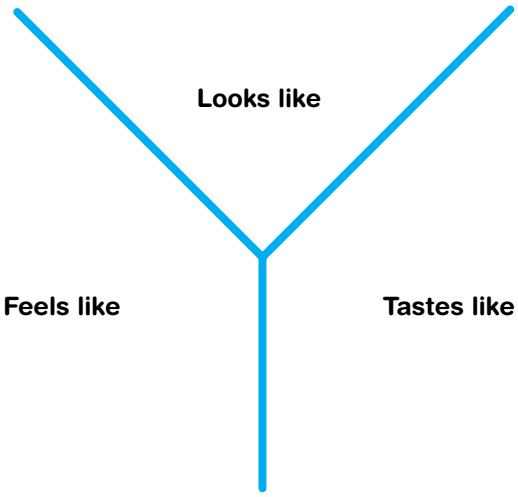
- clear glass or plastic pitcher of ice water
- clear glass or plastic pitcher of ice water with powdered drink mix added that does not significantly cloud or color the water

- 2 trays of prepared cups for each child: one tray of cups containing plain ice water, the second, ice water with clear drink mix
- chart paper and colored markers
- materials needed for concept map (connecting material such as yarn, masking tape, or paper arrows; picture word cards labels or labeled pictures of icons)
- photographs of water in three states: solid, liquid, gas (see Educator Resources)
- children's books on water (see Educator Resources)

Procedures

Introduction (20 minutes)

1. Review briefly the class concept map and what children have been learning about water.
2. Refer to the top left-hand corner of the concept map where Blue Planet is written. Reinforce that most of the water on the Earth's surface is salty—and, therefore, cannot be used by people for drinking, cooking, bathing, or playing. Only a small amount of clean, safe (potable) water is available for our use.
3. Display a clear pitcher full of ice water and a Y chart:



Based on the ages and size of the class, the educator may wish to complete the Y chart with small groups of children instead of a whole class. A Y chart may be adapted for various purposes and contain other descriptors, such as "sounds like."

4. Explain that the pitcher contains clean, safe (potable) water.
5. Give each child a small cup of the cold water. As a group, describe what the water looks like, tastes like, and feels like. Write the descriptive words in the appropriate sections of the Y chart using a colored marker.
6. Ask children a series of probing questions as they taste the water, such as:

   Where do you think this water came from? (the faucet, bottled water)

How do you know it is safe for drinking? (People in our country trust that the water delivered to our homes and communities in pipes or purchased in bottles or other containers is safe for drinking, cooking, bathing, and playing.)

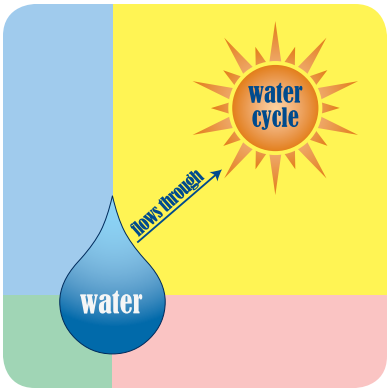
What is ice made of? (water) *What does this mean about water?* (Water can change in temperature and form; in the pitcher, we can see two states of water: liquid and solid.)

7. Afterward, show a second prepared pitcher of ice water containing a clear powdered drink mix (without telling students its contents). Repeat the process by filling in the Y chart using a different colored marker.

8. Ask children to explain what happened. Relate water solubility to the never-ending cycle of water as it travels throughout the Earth, the atmosphere, and even the bodies of plants and animals, and how different materials may dissolve in water that may be unsafe for living things, some of which may be invisible or without flavor. Emphasize that both pitchers of water had a similar appearance but different contents. Therefore, it is important to know your water source is safe before drinking the water, using it for cooking, or bathing or playing in it.

Development (45 minutes)

1. Refer students to the top right-hand corner of the class concept map. Using yarn, masking tape, or other appropriate material, connect water in the center to a picture card of the water cycle. Label the picture card: *water cycle*.



2. Ask children what they think of when they hear the word "cycle." Relate to words they know, such as "bicycle," reinforcing *round-and-round* like a wheel or *never-ending*.

3. Explain that water throughout the Earth and atmosphere travels in a never-ending cycle called the *water cycle*. In the *water cycle*, surface water evaporates into a gas, rises, and then cools and condenses and falls as precipitation, such as rain or snow, and evaporates again, starting the cycle all over. Point to the icon of the sun to reinforce the importance of the sun in the water cycle.

Additional Resource:
Play a video for young children about the water cycle such as Sesame Street's "All About Water" http://www.sesamestreet.org/video_player/-/pgpv/videoplayer/0/051d6163-1563-11dd-a62f-919b98326687/all_about_water.

Additional videos can be found at http://www.sesamestreet.org/videos.

4. Read aloud an age appropriate children's book on the water cycle, such as:

Dorros, A. (1993). *Follow the water from brook to ocean*. NY: HarperCollins.

Locker, T. (2002). *Water dance*. San Diego, CA: Voyager Books.

Strauss, R. (2007). *One well: The story of water on Earth*. Toronto, ON: Kids Can Press Ltd.

Wick, W. (1997). *A drop of water*. NY: Scholastic Press.

5. During and following the reading, engage children in sharing their reactions and learning through questions such as:

   Where do you see water? (Everywhere. When it rains, flowing down the street or dripping from roofs. Water flows from brooks to streams, to rivers, to oceans. Most of the world's water is found in the oceans. Water as rainfall helps fill ponds and lakes, and underground water surfaces through springs.)

   Where does water exist that you cannot see? (Water is in the sky as a gas. Water is also underground.)

   Where does water come from? (It comes from rain and melting snow.)

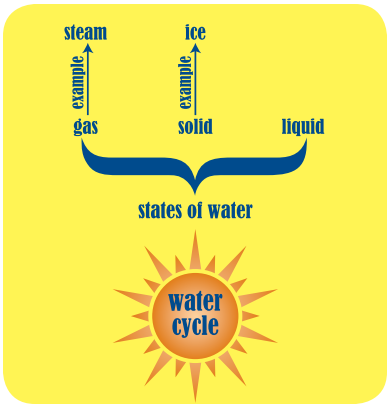
   How does water flow? (It always flows downhill, from higher to lower places. Rainfall may flow from a brook to a stream to a river to an ocean. Eventually water flows to the lowest parts of the Earth. Water also flows among rocks underground.)

   What moves in water as it flows? (Animals such as fish and otters travel in moving water. People travel in water in canoes or other boats. Nonliving things like rocks or pebbles also are moved in water.)

   How does moving water shape the Earth? (Over time, water wears down rock and carries away soil. Eventually, valleys and canyons may be formed.)

   In what ways does water change? (Water can be a liquid, a solid, or a gas. It can be very hot or very cold, or a temperature in between. It can mix with other materials and change in color, taste, and other ways which we cannot see).

6. Point to the word *water cycle* on the concept map. Repeat: The water cycle is a never-ending process that depends on the sun's light energy.



7. Talk aloud during the process of adding to the concept map on *water*:

   In the top right-hand corner of the concept map, we will share our learning about the water cycle. Here, I have connected "water" with "water cycle" because water passes through the process known as the "water cycle."

   Do you remember two forms of water we discussed when completing the Y chart? That's right, liquid and solid. The water in the pitcher was liquid and the ice, solid. These are called states of matter. These are different ways water can exist. These different forms are states of water.

   Connect "water cycle" with a label "states of water." Show students a variety of photographs of water in various states and sort these together. If children are not familiar with gas as a state of matter, introduce this concept.

   What are the three states of water? That's right: solid, liquid, and gas. Connect the label "states of water" to photographs showing water as a solid, liquid, and gas. Label each accordingly.

Sing along to the "Water Cycle Song":
(To the tune of "Clementine")

Evaporation,
condensation,
precipitation on my mind.

This is the water cycle
and it happens all the time.

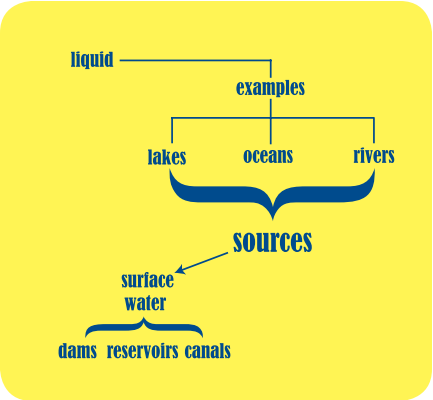
Closing (15 minutes)

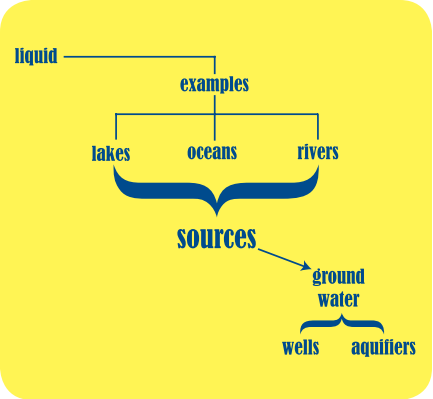
1. Present a slide show or assortment of photos illustrating sources of drinking water. Pause for class discussion, as appropriate.

2. Refer to the class concept map on the *liquid state of water*. Together, engage children in adding to the concept map using words and pictures about types of liquid water found on the Earth, such as lakes, streams, rivers, oceans. Emphasize that these are sources you can see—and they are called *surface water* (collected in dams, reservoirs, canals).

3. Explain that other sources of water come from the ground—called *ground water* (collected in wells and aquifers)—and that you cannot see that water from where we are on the Earth's surface.

4. Conclude that all sources of water are continuously recycled through the water cycle, supporting all life on the Blue Planet.

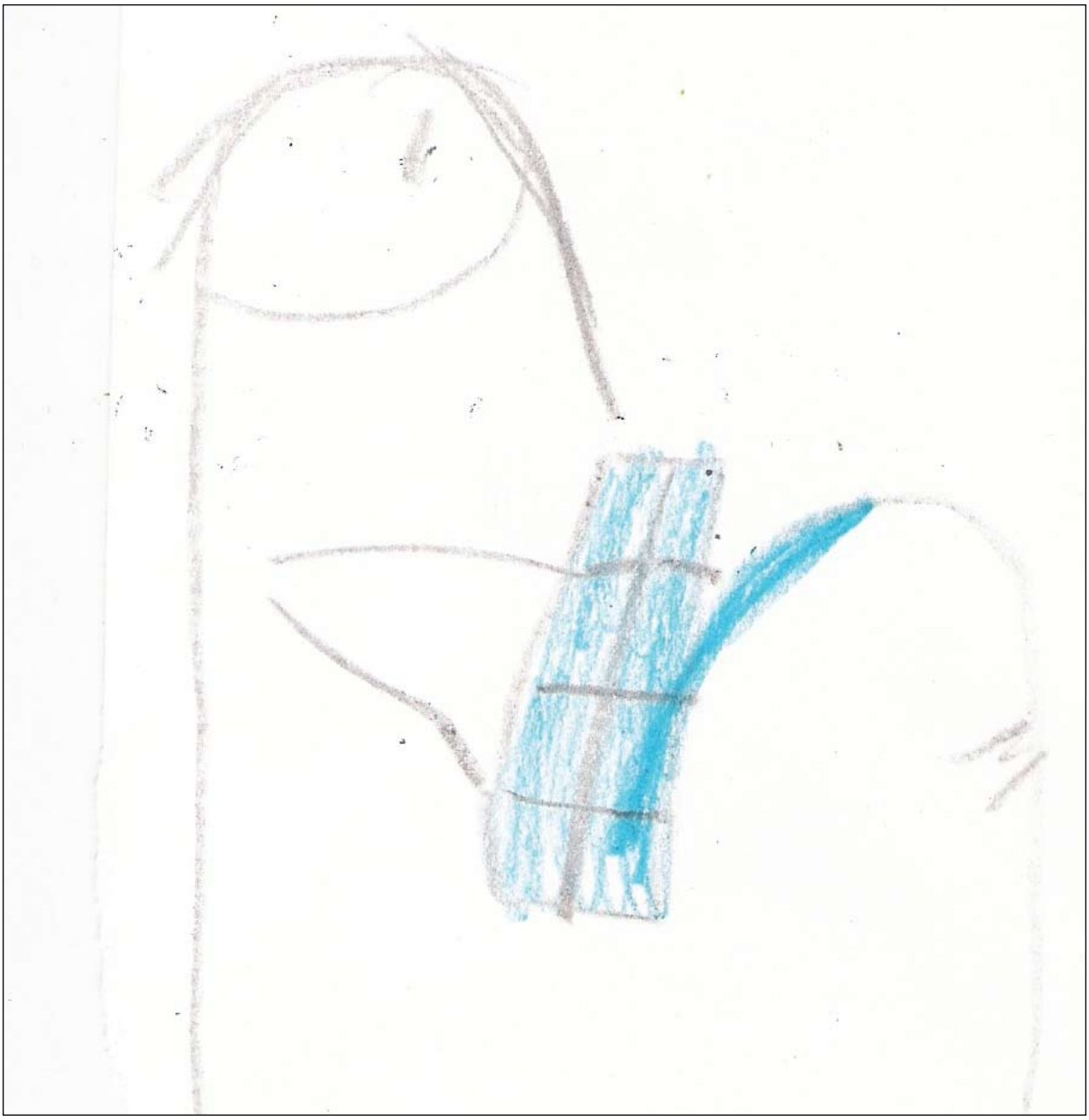




Sample Children's Artwork

Sample prompt: Where do we see the three forms or states of water (solid, liquid, gas)?

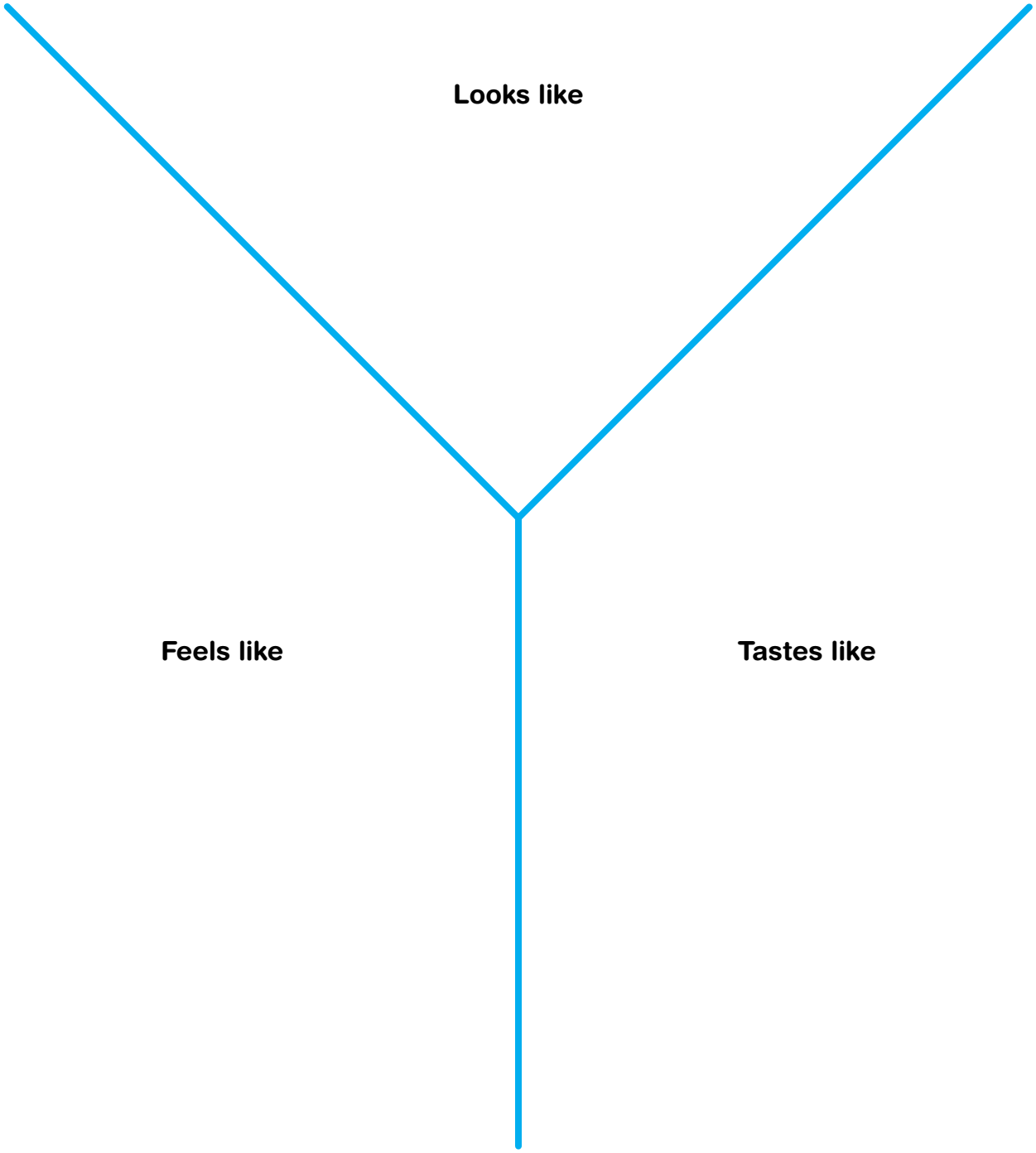
"Water comes from the clouds. I am walking here and it's raining."



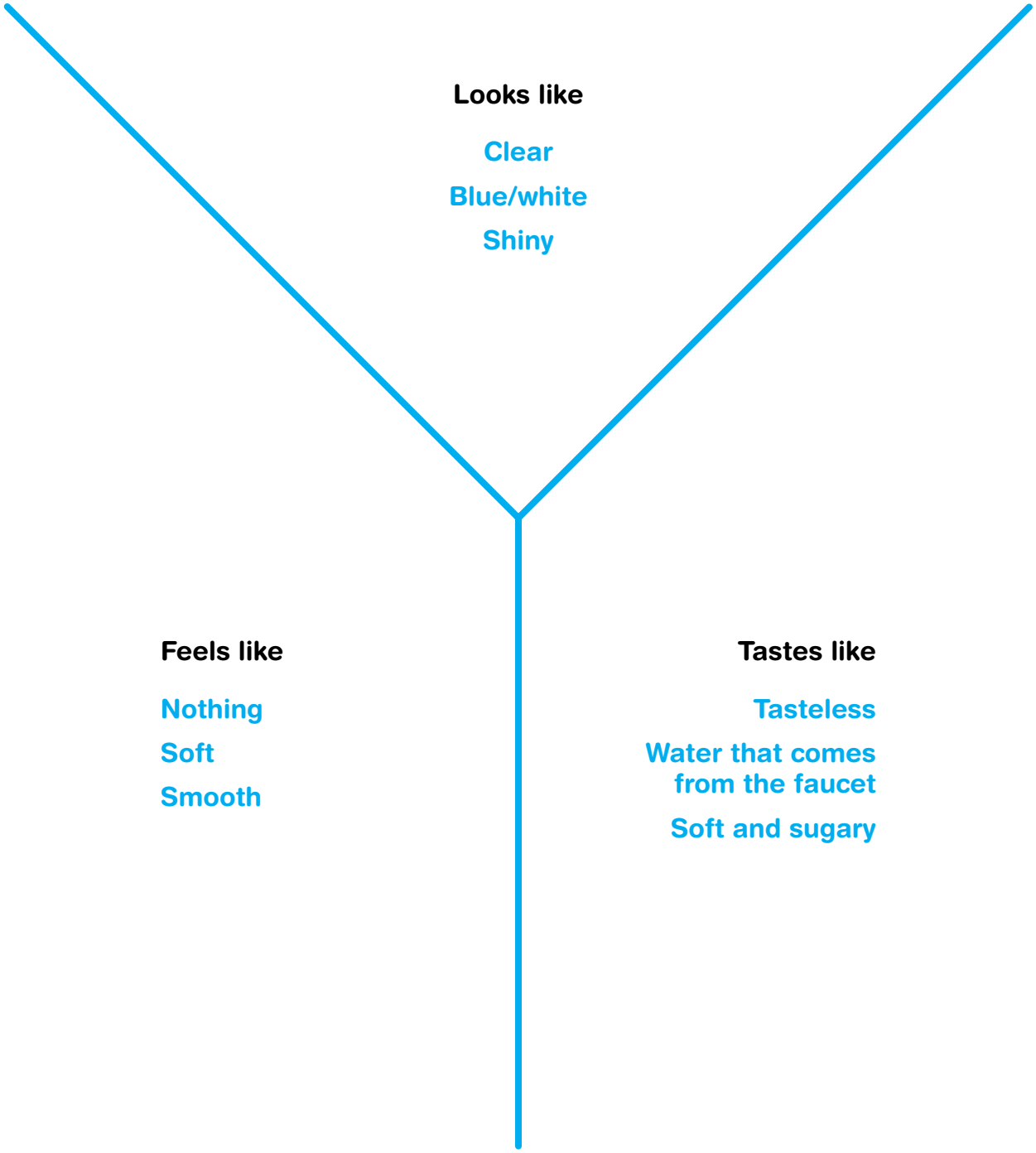
“I was making ice cubes by myself…”

“Here, I drew me taking a picture of the clouds. It’s raining and it’s hailing and the sun is shining.”

Water “Y Chart”



Sample Water "Y Chart"



SAFE WATER, HEALTHY COMMUNITIES

It is important to reinforce to children the importance of sanitation and the dangers of using or consuming dirty water. However, the educator must use his or her judgment regarding serious issues, such as the occurrence of water-borne illnesses that cause serious illness or death, especially among children.

Big Idea

Too much water (flooding), too little water (drought), and dirty water can be harmful to all living things. We must use the Earth's water wisely.

Objectives

Students will:

- Demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.
- Demonstrate responsible water use and sanitation, including hygienic practices such as proper hand-washing and safe waste disposal.

Vocabulary

The following words may not be daily occurrences in a student's vocabulary. Feel free to use this list as a resource for students to expand their working vocabulary as they encounter these words in this unit.

- Clean
- Conserve
- Drought
- Hygiene
- Health/healthy
- Flood
- Polluted
- Sanitation
- Scarce

Materials Needed/Setup

- 1 globe
- computer with Internet connection and videos downloaded
- projector

- materials needed for concept map (connecting material such as yarn, masking tape, or paper arrows; picture word cards labels or labeled pictures of icons)
- children's books on water (see Educator Resources)

Note: Should technology not be available, the following are appropriate substitutes:

- printed photographs of water uses and water issues
- illustrations or artworks showing various depictions of water use and water issues

Procedures

Introduction (30 minutes)

1. Review briefly the class concept map and what children have been learning about water.
2. Display photos of children and adults using water around the world.
3. Pause as appropriate and ask children questions such as:

   What examples did you see of people using water? (drinking, bathing, brushing teeth, playing, watering crops)

   What are different ways people get their water? (the faucet, the shower, outdoor wells)

   What happens when people do not have enough water, when water is scarce? (They must conserve or use only the amount of water they need. They should not waste water. Turn off the water while brushing teeth and washing dishes, for example.)

   What happens when people have too much water, when there are floods? (Sometimes water can become dirty or polluted. People's homes and communities can become flooded, causing a lot of damage to buildings and farms.)

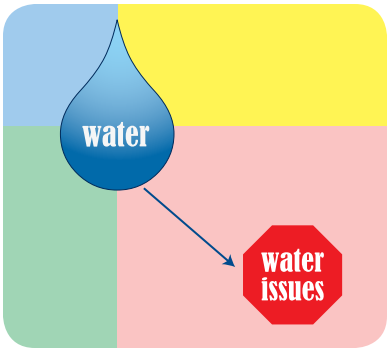
   How does dirty water affect people and other living things all around the world? (It causes illness, and may cause death.)

   How can children practice safe sanitation for good health and hygiene? (It is important to wash hands with clean water and soap, to boil water that may have bacteria, to avoid water that has been polluted by people, farms, and factories.)

   Teachers may print for small groups or project onto a screen for larger groups of children the photos provided by UNICEF's photoessay *Children and Water*.

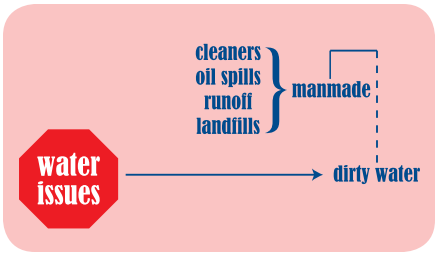
4. Refer to the class concept map, explaining that we will continue to tell the story of water by adding what we have learned.
5. Model aloud the process of adding to the concept map on water:

   In the bottom right-hand corner of the concept map, we will share our learning about water issues or problems around the world. Here, I have connected "water" with "water issues" because water issues affect all living things.

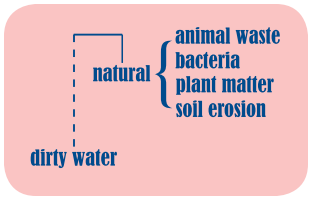


Do you remember what kinds of problems exist related to water? Show a variety of photos to prompt children if necessary. That's right, having dirty water. We should not drink dirty water and it is not safe for bathing, cooking, washing clothes or dishes, or playing. It is harmful to all living things. Connect "water issues" with an image of dirty, polluted water. Apply the label "dirty water."

What causes water to be dirty or polluted? That's right, people can cause water to become dirty or polluted. These are called man-made causes of dirty water. Connect "dirty water" to "manmade." *What are examples of people making water dirty? Yes, oil spills, throwing away chemicals, littering.*

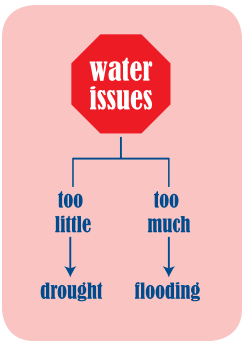


What other reasons may cause water to become dirty or polluted? That's right, nature can cause water to become dirty. These are called natural causes of dirty water.



Connect "dirty water" to "natural." What are examples of nature making water dirty? Yes, waste created by wildlife, the result of a natural disaster, such as a tsunami, earthquake, or hurricane where materials pollute the water, or natural soil erosion into water are examples of natural causes of polluted water.

What other water problems exist? Yes, there can be too little water. This is called a drought. Connect "water issues" with one or more photos of a drought. Label the photo(s) "drought" and the connecting piece, "too little." *What happens when there is too much water? What is this called? That's right, this is called a flood.* Connect "water issues" with one or more photos of a flood. Label the photo(s) "flood" and the connecting piece, "too much."



6. Reinforce that water issues may include having too much water, too little water, and dirty and/or polluted water. These problems can be caused by humans, nature, or both. Life on Earth depends on water, and safe water means healthy communities. Because there is so little water available on the Blue Planet for our use, we must use water wisely by conserving water and limiting the pollution we cause.

The PWIM Model may be repeated as appropriate throughout the unit of study using different photographs or illustrations to enhance students' concept and language and literacy development, as well as their observation skills.

Development (30 minutes)

1. To further develop children's understanding of water-related issues that affect all living things, engage children in examining a photo showing a flood, drought, polluted waters, or sanitary practices (see Hand-washing with soap saves lives). (See Educator Resources for sample photographs).

2. Using the Picture-Word Induction Model (PWIM), display the chosen photograph on chart paper, on an overhead transparency, or projected onto an interactive whiteboard. Guide children as they describe what they see. For example:

   What do you see in this photograph?

   What word would you use to describe it [the student's response]? What is it called?

   Let's spell this together. [For example, The water is dirty. dirty – d – i – r – t – y – dirty.

3. Use a marker or sentence strips to label what children describe in the photograph.

4. As a class, write a few sentences on chart paper, sentence strips, or using an overhead projector to describe what children observed in the photograph.

5. If appropriate, have children write sentences independently, using vocabulary the class named during the process.

Additional Resources: Read a book about germs and how to stop their spreading such as:

Collins, R. (2004). *Germs*. New York: Bloomsbury USA Children's Books

Verdick, E. (2006). *Germs Are Not for Sharing*. Minneapolis, MN: Free Spirit Publishing.

Closing (10 minutes)

1. Practice healthy, hygienic practices to ensure healthy communities by showing children a video of proper hand-washing such as Sesame Street's "Washing Your Hands,"UNICEF's photoessay "Hand washing with soap saves lives," and by modeling proper hand-washing in the classroom. Sing the Sesame Street song while rubbing hands thoroughly with soap and water:

   Wash, wash, wash my hands,
   Make them nice and clean!
   Rub the bottoms and the tops
   And fingers in between.

Sample Children's Artwork

Sample prompt: How do people use water to stay healthy and clean?

"This is my dad in my house taking a shower in it (water)."

“Here I am bathing outside in the bathtub.”

“This is me drinking a whole bunch of water and I just don’t wanna stop.”

“This is me washing my hands. I turn it on and cut it back off.”

WATER CARE AND CONSERVATION

In this culminating lesson, children will learn how they can care for and conserve water. Having prerequisite knowledge about water issues locally and globally, children will demonstrate responsible water use. They will also learn how organizations such as UNICEF bring aid to children and communities affected by the lack of safe water or adequate sanitation facilities. This lesson culminates in the celebration of World Water Day on March 22, whereby children, families, and the community bring awareness to issues related to water and sanitation.

Big Idea

Water is essential to life on Earth. We must all take part in caring for and conserving our Earth's natural resources. Each person matters.

Objectives

Students will:

- Demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.
- Demonstrate responsible use of water, including using only the amount you need, limiting the amount you use for fun, and keeping water sources clean.
- Recognize the work of organizations such as UNICEF that bring water, sanitation, and hygiene to children worldwide.

Vocabulary

The following words may not be daily occurrences in a student's vocabulary. Feel free to use this list as a resource for students to expand their working vocabulary as they encounter these words in this unit.

- Care
- Conserve
- Conservation
- Natural resources

Materials Needed/Setup

- chart paper and markers for concept of definition map
- pictures showing examples and non-examples of conservation
- materials needed for concept map (connecting material such as yarn, masking tape, or paper arrows; picture word cards labels or labeled pictures of icons)
- children's books on water (see Educator Resources)

Note: Should technology not be available, the following are appropriate substitutes:

- printed photographs of examples and non-examples of water conservation.
- illustrations or artworks showing various depictions of water

Procedures

Introduction (30 minutes)

1. Review briefly the class concept map and congratulate children for all they have been learning about water.

2. Refer to the previous lesson where the class discussed that water issues may include having too much water, too little water, and dirty water. These problems can be caused by humans, nature, or both. Life on Earth depends on water, and safe, clean water creates healthy communities. Because there is so little water available on the Blue Planet for our use, we must use water wisely by conserving it and limiting the pollution we cause.

3. Introduce the concept of conservation. Ask children if they have heard of the word and what they think it means. Explain that together we will explore the concept of conservation, especially as it relates to water.

4. Read aloud an age appropriate children's book about conservation, such as:

   Bang, M. (1997). *Common ground: The water, earth, and air we share*. NY: Blue Sky Press.

   Strauss, R. (2007). *One well: The story of water on earth*. Toronto, ON: Kids Can Press Ltd.

5. During and after the reading, engage children in sharing their reactions and learning through questions such as:

Additional Resource:
Play a video for children about water conservation, such as Sesame Street's "Water Conservation" http://www.sesamestreet.org/video_player/-/pgpv/videoplayer/0/3a878aa1-1cff-464d-a0b0-64b204cdce3c/water_conservation or "Conservations With My Father." http://www.sesamestreet.org/video_player/-/pgpv/videoplayer/0/e52ca784-1562-11dd-a62f-919b98326687/conservations_with_my_father.

Additional videos can be found at http://www.sesamestreet.org/videos.

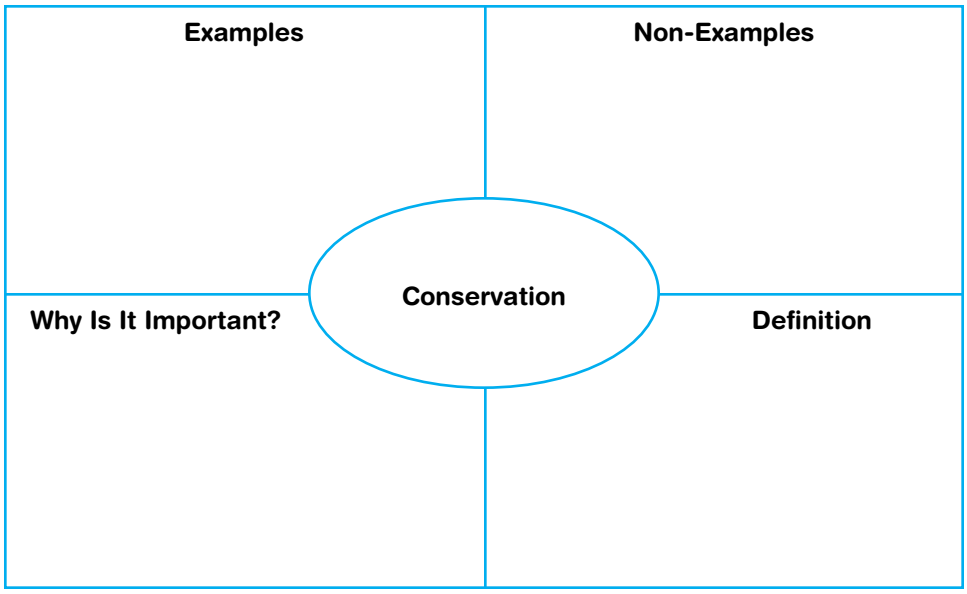
What are examples of natural resources? (air, water, sunlight, wind, Earth's materials [oil, gold, coal])

Why is it important to limit how many resources you use? (Natural resources are limited; some are renewable, but it may take a long, long time to replenish them; as the world becomes more highly populated, there are fewer resources for us all.)

How do each person's actions make a difference? (We all make decisions, such as our use of the Earth's resources, that can affect other people or living things in good ways or bad. For example, an oil spill in one location can move with the flow of water, affecting living creatures in another location. Because we share the same Blue Planet, our actions to conserve or waste water can affect all Earth's peoples and living creatures. Together, people can create positive change for others and the environment.)

Development (45 minutes)

1. Display a concept of definition map with conservation in the center.



2. Using ideas generated from the reading and the entire unit of study, record examples of conservation (e.g., turning off water while brushing teeth, taking short showers, washing only full loads of dishes or laundry, etc.) and non-examples of conservation (e.g., leaving water running while brushing teeth, taking long showers, washing small loads of dishes or laundry).

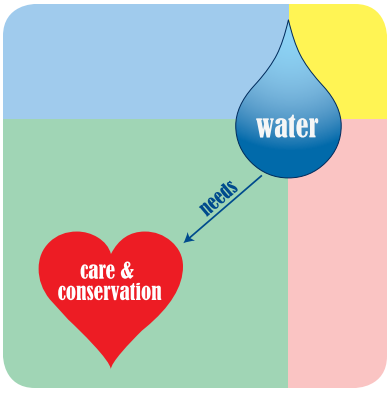
For emergent readers, the educator may include a combination of pictures and words to post on the concept of definition map.

3. Discuss: *Why is conservation important?* (Conservation means more clean, safe resources for everyone; conservation protects life for all living things.) Record children's ideas.

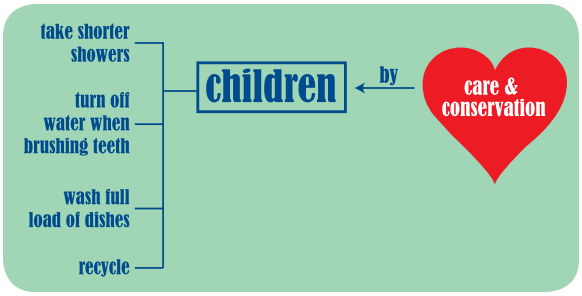
4. Lastly, create a shared class definition of conservation.

5. Refer to the final quadrant of the class concept map of water.

   In the bottom left-hand corner of the concept map, we will finish our class concept map on water. Let's share what we have learned about conservation. Here, I will connect "water" with "care and conservation" because water needs care and conservation.



   We discussed all the ways that you can care for and conserve water. Connect "care and conservation" with the word "children." Let's look at our chart. What were examples on our chart of children like you practicing conservation? Using sentence strips, add children's examples.

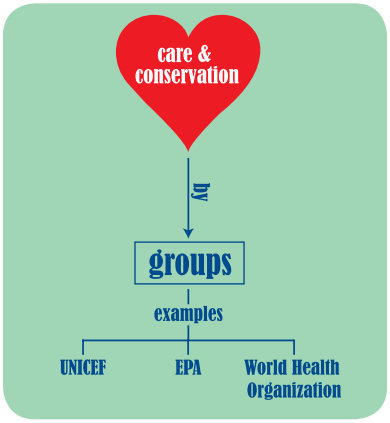


6. Explain that individual people join together to care for and conserve our natural resources. These groups work to improve life for the Earth's living creatures and the environment. Groups include UNICEF, the Environmental Protection Agency (EPA), and the World Health Organization (WHO).

Take a class photo and paste it above the label "children." Encourage parents to send in photos of children practicing water care and conservation at home and in the community to add to the concept map.

7. Show photos of groups of people working together for environmental and humanitarian causes. Refer to the concept map on water.

   Each person can make a positive difference for our environment and living creatures. When individuals join together, they form groups that can do positive work in the community and around the world. Connect "care and conservation" with the word "groups." Post photos of groups or organizations such as UNICEF working together to ensure people around the world have access to safe, clean water.



Closing (ongoing)

1. Introduce the United Nations' (UN) World Water Day, held annually on March 22. This is a day dedicated to increasing awareness about water issues around the world.

2. Ask children how they would like to participate in World Water Day—such as by creating a photo gallery in the school showing the importance of water in their lives; by preparing a public service announcement with their ideas for water conservation and sanitation; by organizing a school water walk to raise awareness. Include family and community partners in planning a schoolwide World Water Day.

Sample Children's Artwork

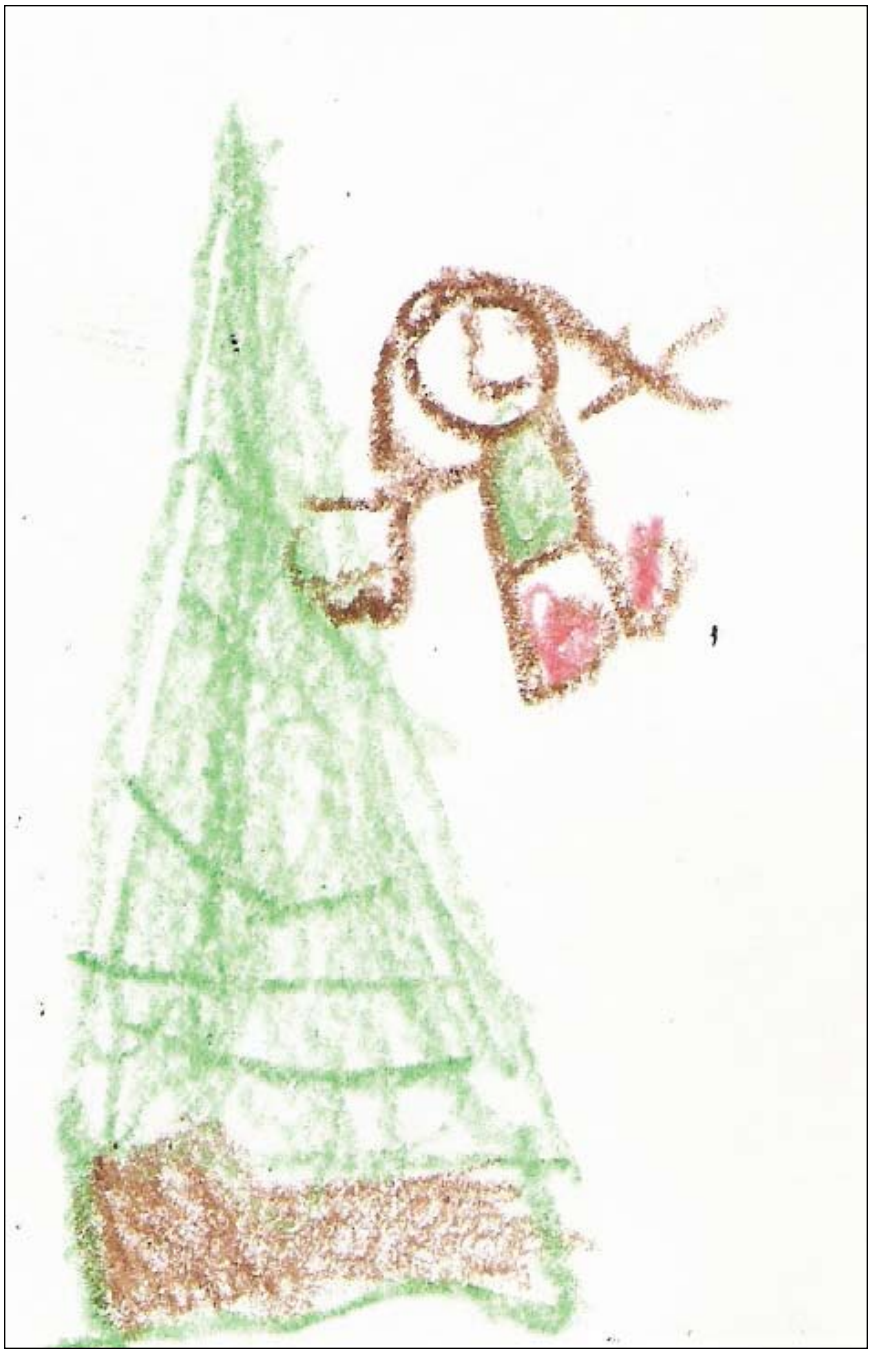
Sample prompt: How can you help to conserve water and other natural resources?

"I am turning off the water so I don't waste it."

“This is me recycling.”

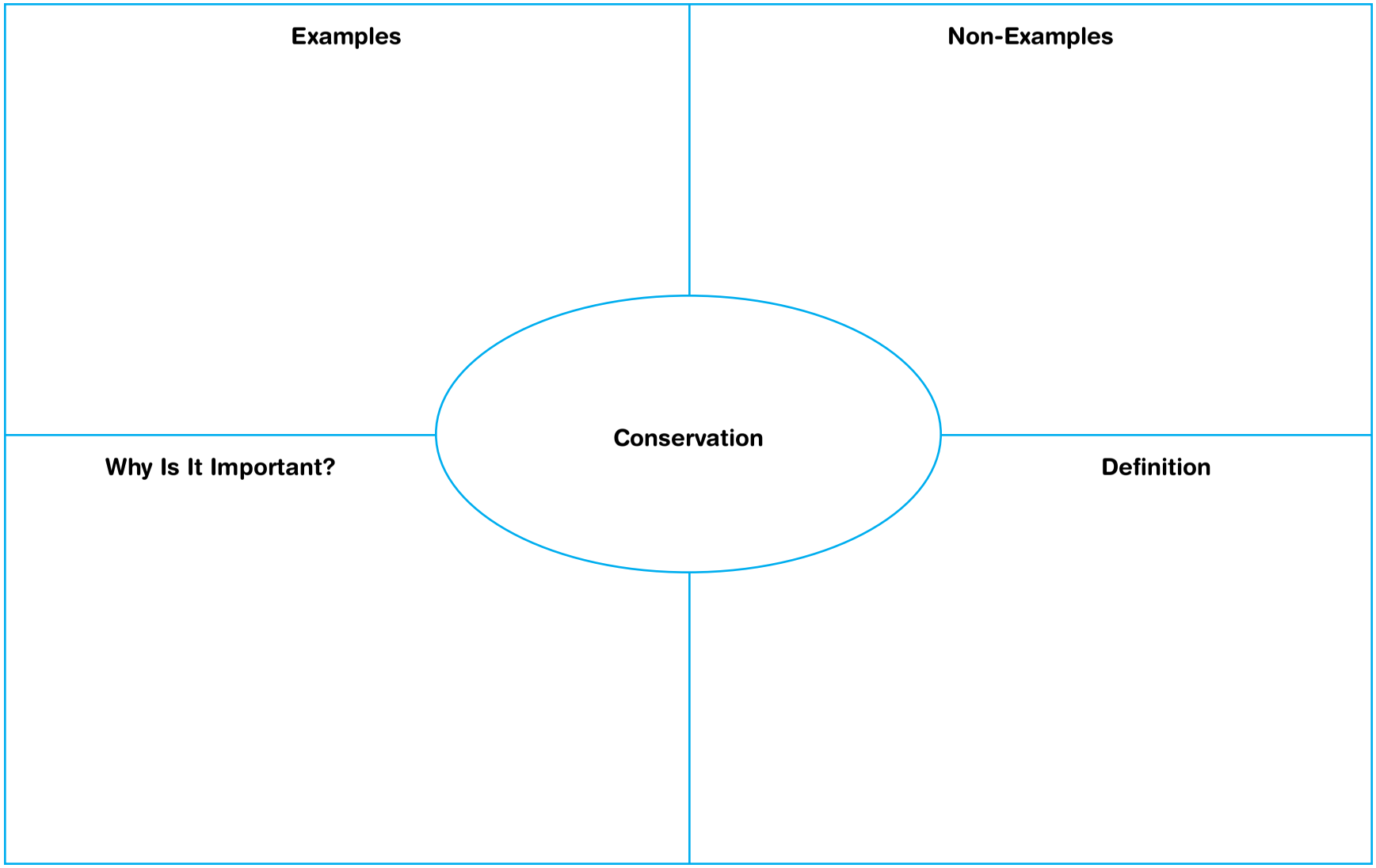
Sample prompt: What are examples of you not conserving or protecting Earth's natural resources?

"I am cutting down trees and the Earth is going 'grrr.'"



“I am chopping down trees in the forest.”

Concept of Definition Map



Learning Centers

Adults may support and enhance children's learning about water in a variety of ways. It is recommended to use open-ended questioning while interacting with children at each center, such as "Please explain your painting (your building, your play)" or "How does your work relate to water?"

- **Art Center:** Children may make an illustration of water, such as a river, lake, pond, or ocean. Older children may write simple sentences to accompany their artwork. Engage children in comparing and contrasting illustrations or photographs of water—such as those showing people using surface water or ground water. Create a class mural showing the water cycle. Have students illustrate and label different parts of the water cycle; post students' artwork on a large wall or chart paper.
- **Block Center:** Children may build and explain a variety of structures that relate to water, such as bridges or canals.
- **Dramatic-Play Center:** With adult support, engage children in a reader's theater about water, such as "Life of a Water Droplet."
- **Listening Center:** Provide a variety of CDs containing water sounds, such as waterfalls, rain, or the ocean.
- **Reading Center:** Provide a variety of fiction and nonfiction texts on water for children to read or explore (see Educator Resources).
- **Sand-and-Water Center:** With adult supervision, have children practice mixing materials into a container of water, such as food coloring or cocoa powder. Explore how water dissolves materials and relate to water becoming dirty and unsafe to drink.
- **Science Center:** On a computer with Internet access, play a game or take a virtual tour of the water cycle with one or more children (see Educator Resources).
- **Writing Center:** Display a variety of artworks depicting water (see Educator Resources). Have children write a simple story about what they see.

EDUCATOR RESOURCES

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Connection Between Home and School

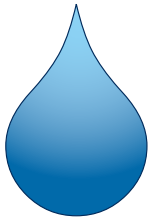
Prior to beginning this unit, send home a family newsletter highlighting the unit's concepts and learning objectives (for example, see page 22). Encourage families to send to school photographs related to water from magazines or those taken by children or parents. Place these as appropriate on the class concept map.

Additional recommendations for involving family in children's learning about water and sanitation:

- Send home the handout "Water, Wonderful Water!" to encourage family discussions about water use at home and in the community.
- Encourage parents or community members who are experts on water to visit the class and make a presentation.
- Invite families to volunteer in the classroom as children learn about water in the learning centers.
- Provide a list of recommended children's books and appropriate websites about water to encourage family involvement at home (see References).

Sample Picture Cards

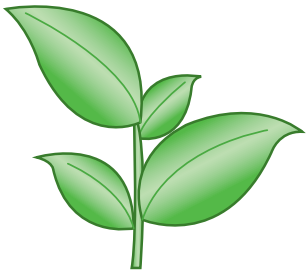
water



Blue Planet

living things

plants



animals

drinking

playing

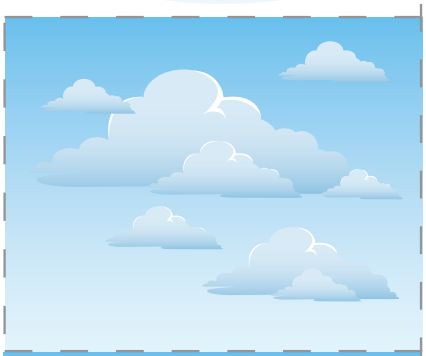
bathing

cooking

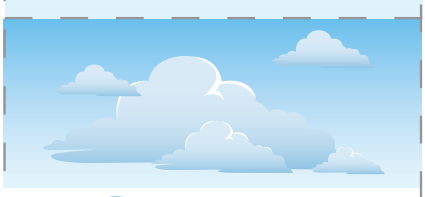
solid

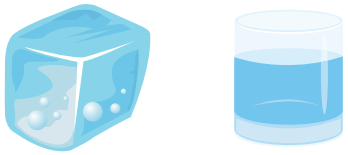
liquid

gas



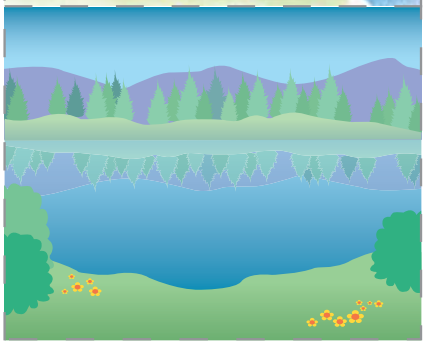
states of water



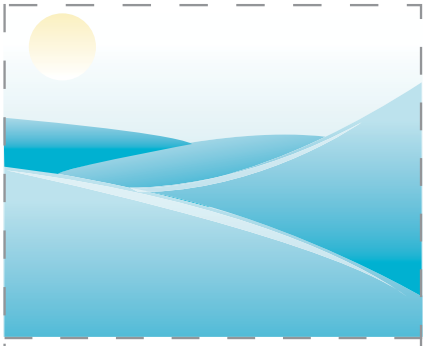


water cycle

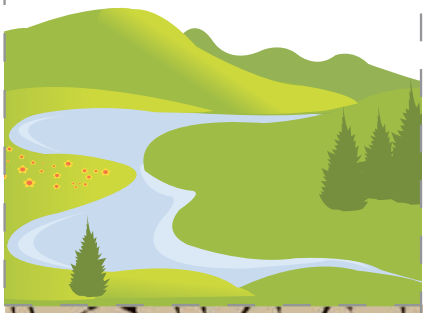
lake



ocean



river



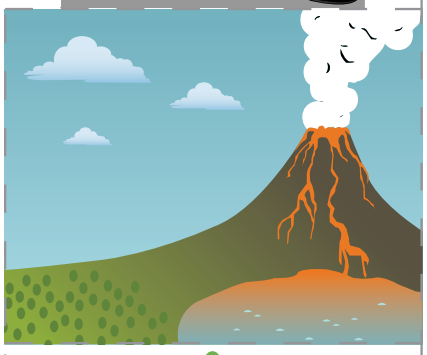
drought

flood

pollution

manmade

natural



groups

people

Sample Photos of Water Sources and Water Use

Objective #1: Demonstrate understanding that water is essential to life on Earth. Plants and animals need water to live.

©UNICEF/NYHQ2007-0872/Cranston
Sudan, 2007
A boy collects water from a handpump near a primary school in Sothern Sudan.

©UNICEF/NYHQ2006-2080/Taylor
Maldives, 2006
A boy enjoys water from a UNICEF-supported rainwater-harvesting program in Maldives.

Objective #2: Demonstrate understanding that all water on Earth is recycled through a continuous process called the *water cycle*.

©U.S. Fund for UNICEF/Abagail Quesinberry
Nicaragua, 2007

©UNICEF/NYHQ1991-0237/Toutounji
Yemen, 1991
Women collect water in the city of Thula, Yemen.

Objective #3: **Recognize water in its three states: solid, liquid, gas**

©UNICEF/NYHQ2000-0578/Noorani
Bangladesh, 2000

A two-year-old girl splashes water near Dhaka, Bangladesh.

©UNICEF/NYHQ2005-0491/Ami Vitale
India, 2005

A women and girl collect water from a pump near Chennai, India.

Objective #4: **Demonstrate responsible water use and sanitation, including using only the amount of water you need, limiting the amount you use for fun, keeping water sources clean (e.g., safe waste disposal), and exhibiting hygienic practices (e.g., proper hand-washing).**

©UNICEF/NYHQ2007-0404/Giacomo Pirozzi
Central African Republic, 2007

A boy washes his hands in Boda, Central African Republic.

©UNICEF/NYHQ2008-1275/Estey
Indonesia, 2008

Children was their hands at an elementary school in a village in Indonesia.

Objective #5: **Recognize the work of organizations such as UNICEF that bring water, sanitation, and hygiene to children worldwide.**

©UNICEF/NYHQ2005-1672/Mohan
Thailand, 2005

Three girls smile and laugh while they drink water at a UNICEF-provided water point in school in Thailand.

©UNICEF/NYHQ2003-0515/Noorani
Iraq, 2003

A boy drinks water from a plastic bottle in his neighborhood in Iraq.

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